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CLAIMS

1. A method comprising:

allowing a colloid particle the ability to become immobilized with respect to a non-colloidal structure; and

determining immobilization of the colloid particle relative to the non-colloidal structure.

2. A method as in claim 1, wherein the colloid particle comprises an auxiliary signaling entity.

3. A method as claim 2, wherein the auxiliary signaling entity comprises a dye, pigment, electroactive molecule, chemiluminescent moiety, electrochemiluminescent moiety, fluorescent moiety, up-regulating phosphor, or enzyme-linked signaling moiety including horse radish peroxidase and alkaline phosphatase.

4. A method as in claim 3, wherein the signaling entity comprises a metallocene.

5. A method as in claim 4, wherein the signaling entity comprises ferrocene or a ferrocene derivative.

6. A method as claim 1, comprising allowing a plurality of colloid particles to fasten to the non-colloidal structure, and determining fastening of the plurality of particles to the non-colloidal structure.

7. A method as in claim 6, wherein the plurality of colloid particles comprises auxiliary signaling entities.

8. A method as in claim 7, wherein the auxiliary signaling entities comprise a dye,pigment, electroactivemolecule, chemiluminescent moiety, electrochemiluminescent moiety, fluorescent moiety, up-regulating phosphor, or

enzyme-linked signaling moiety including horse radish peroxidase and alkaline phosphatase.

9. A method as in claim 1, further comprising providing a biological or chemical agent linked to or adapted for linkage to the non-colloidal structure, and a binding partner of the biological or chemical agent linked to or adapted for linkage to the particle, the allowing step comprising allowing the particle to become linked to the non-colloidal structure via the agent and the binding partner.

10. A method as in claim 1, wherein the non-colloidal structure is a bead.

11. A method as in claim 10, wherein the bead comprises polymeric material, agarose, tentagel, and/or magnetic material.

12. A method as in claim 11, wherein the bead is a polystyrene bead.

13. A method as in claim 9, comprising allowing the agent to be linked to the non-colloidal structure, the binding partner to be linked to the particle, and the agent and the binding partner to bind to each other.

14. A method as in claim 13, comprising allowing the agent and the binding partner to biologically bind to each other.

15. A method as in claim 9, wherein the biological or chemical agent is a drug candidate, and the binding partner is a target of the drug candidate.

16. A method as in claim 15, wherein the non-colloidal structure is a bead.

17. A method as in claim 15, wherein the non-colloidal structure is a surface of an essentially planar substrate or chip.

18. A method as in claim 9, wherein the biological or chemical agent is a nucleic acid sequence.

19. A method as in claim 9, wherein the biological or chemical agent is a peptide, and the binding partner is a binding partner of the peptide.

20. A method as in claim 9, wherein the biological or chemical agent is a protein, and the binding partner is a binding partner of the protein.

21. A method as in claim 1, wherein the colloid particle carries an immobilized ligand, and the non-colloidal structure carries a binding partner to the ligand, the method comprising allowing the colloidal particle the ability to fasten to the non-colloidal structure in the presence of a candidate drug for interruption of binding of the ligand to the target.

22. A method as in claim 1, wherein the non-colloidal structure is a bead, further comprising providing a plurality of beads, a plurality of biological or chemical agents adapted for linkage to the beads, a plurality of particles, and a plurality of binding partners of the biological or chemical agents adapted for linkage to the particles, wherein at least some of the agents and the binding partners are suspected of having the ability to bind to each other, the method comprising exposing at least some of the beads to at least some of the particles, and determining immobilization of the particles on the beads.

23. A method as in claim 22, wherein the biological or chemical agents are drug candidates and the binding partners are targets of the drug candidates, the method comprising providing at least a first and a second bead in two separate locations, each carrying a different immobilized drug candidate, exposing the plurality of particles to the at least two beads, and differentiating linkage of the particles to the first bead versus the second bead.

24. A method as in claim 23, wherein the at least two beads are separately located in at least two different wells of a multi-well plate.

25. A method as in claim 22, wherein the biological or chemical agents are drug candidates and the binding partners are targets of the drug candidates, the method comprising providing at least two beads carrying a drug candidate in two separate locations, exposing the first bead to a first set of colloid particles carrying a first target of the drug candidate, and exposing the second bead to a second set of colloid particles carrying a second target of the drug candidate, and differentiating linkage of the first set of particles to the first bead versus the second set of particles to the second bead.

26. A method as in claim 9, comprising determining immobilization of the particle on the non-colloidal structure by determining a change in spectrum of absorbed or transmitted electromagnetic radiation interacting with the particle.

27. A method as in claim 9, comprising determining immobilization of the particles on the non-colloidal structure by visual inspection.

28. A method as in claim 22, comprising providing a plurality of the beads and agents linked to the beads, a plurality of the particles and binding partners linked to the particles, and exposing the particles to the beads and determining immobilization of the particles on the beads.

29. A method as in claim 9, wherein at least one of the agent or binding partner is adapted for linkage to the non-colloidal structure or particle, respectively, via an affinity tag/binding partner linkage.

30. A method as in claim 9, wherein at least one of the agent or binding partner is adapted for linkage to the non-colloidal structure or particle, respectively, via a metal binding tag/metal/chelate linkage.

31. A method as in claim 30, wherein at least one of the agent or binding partner carries immobilized thereto a chelate coordinating a metal, and at least one of the agent or binding partner is derivatized with a polyamino acid tag.

32. A method as in claim 9, wherein at least one of the agent or binding partner is adapted for linkage to the non-colloidal structure or particle, respectively, via a self-assembled monolayer.

33. A method as in claim 9, wherein at least one of the agent or binding partner is adapted for linkage to the bead or particle, respectively, via complementary nucleic acid sequence pairs.

34. A method as in claim 9, wherein the binding partner is adapted for linkage to the particle via glutathione/glutathione-s-transferase ligand interaction.

35. A method as in claim 9, comprising:

providing at least a first and a second non-colloidal structure comprising polymeric beads and at least a first and a second agent linked to the first and second beads, respectively;

providing a plurality of colloid particles each carrying immobilized thereto a suspected binding partner of the first and/or second agent;

exposing the beads to the particles; and

differentiating linkage of the particles to the first bead vs. the second bead.

36. A method as in claim 35, wherein the first and second agents linked to the first and second polymeric beads are suspected of biological or chemical interaction with the binding partner, and the differentiating step comprises differentiating biological interaction between the first agent and the binding partner vs. the second agent and the binding partner.

37. A method as in claim 9, comprising:

providing a plurality of non-colloidal structures comprising beads each carrying the agent immobilized thereto;

providing a first set and a second set of colloid particles, the first set each carrying immobilized thereto a first suspected binding partner of the agent and the second set each carrying immobilized thereto a second suspected binding partner of the agent;

exposing at least a first of the beads to the first set of particles and at least a second of the beads to the second set of particles;

differentiating linkage of the first set of particles to the first bead vs. the second set of particles to the bead.

38. A method as in claim 37, wherein the first and second suspected binding partners are suspected of biological or chemical interaction with the agent, and the differentiating step comprises differentiating biological interaction between the agent and the first suspected binding partner vs. the agent and the second suspected binding partner.

39. A method as in claim 1, wherein the non-colloidal structure is a cell.

40. A method as in claim 39, further comprising providing a ligand for a receptor or protein at a surface of the cell, adapted for linkage to the particle, the allowing step comprising allowing the particle to be linked to the cell via the ligand interacting with the receptor or protein.

41. A method as in claim 39, wherein the ligand is adapted for linkage to the particle via a self-assembled monolayer.

42. A method as in claim 40, wherein the ligand is a peptide, protein, antibody, enzyme, or small molecule.

43. A method as in claim 40, wherein the ligand is adapted for linkage to the particle via an affinity tag/binding partner linkage.

44. A method as in claim 40, wherein the ligand is adapted for linkage to the particle via a metal binding tag/metal/chelate linkage.

45. A method as in claim 42, wherein the ligand carries a polyamino acid tag and the particle carries an immobilized chelate coordinating a metal.

46. A method as in claim 45, wherein the chelate is nitrilotriacetic acid.

47. A method as in claim 45, wherein the particle carries a self-assembled monolayer including the nitrilotriacetic acid.

48. A method as in claim 45, wherein the particle carries a self-assembled monolayer including the immobilized chelate .

49. A method as in claim 40, comprising exposing the ligand and the particle to the cell, allowing the ligand to link to the particle, and determining fastening of the ligand to the receptor or protein.

50. A method as in claim 39, comprising determining immobilization of the particle on the cell by determining a change in spectrum of absorbed or transmitted electromagnetic radiation interacting with the particle.

51. A method as in claim 39, comprising determining immobilization of the particle on the cell electronically.

52. A method as in claim 51, comprising determining immobilization of the particle on the cell via alternating current voltammetry.

53. A method as in claim 50, comprising determining immobilization of the particle on the cell by visual inspection.

54. A method as in claim 39, comprising:
providing a cell presenting a receptor or protein at a surface thereof;
providing a colloid particle; and
allowing the colloid particle to fasten to the receptor or protein.

55. A method as in claim 54, wherein the colloid particle includes an auxiliary signaling entity.

56. A method as in claim 1, wherein the non-colloidal structure is a cell exposing a receptor or protein at a surface thereof, further comprising providing a ligand for the receptor or protein adapted for linkage to the particle and exposing the ligand and the particle to the cell in the presence of a candidate drug for disruption of interaction between the ligand and the receptor or protein; and
determining fastening of the particle to the cell.

57. A method as in claim 56, wherein the determining step involves determining inhibition of fastening of the particle to the cell indicative of effectiveness of the candidate drug in disrupting receptor or protein/target protein interaction.

58. A method as in claim 56, comprising providing at least a first and a second cell in separate locations, exposing the first cell to a ligand for a cell receptor or protein of the first cell and a colloid particle, the ligand adapted for linkage to the particle, and a first candidate drug for disruption of interaction between the ligand and the receptor or protein, and adding to the second cell the ligand and the colloid and a second candidate drug for disruption of interaction between the ligand and the receptor or protein, and differentiating linkage of the particle to the first cell versus the second cell.

59. A method as in claim 1, wherein the non-colloidal structure is a cell exposing a receptor or protein at a surface thereof, further comprising:

providing at least two of the cells in separate locations;

exposing each of the cells to a different target protein to a cell receptor or protein and a colloid particle adapted for linkage to the respective target protein; and

determining fastening of the particles to the cells indicative of binding of the different target proteins to the cell receptor or proteins.

60. A method as in claim 9, wherein the non-colloidal structure is a magnetic bead and the colloid particle comprises an auxiliary signaling entity.

61. A method as in claim 60, wherein the signaling entity is a metallocene.

62. A method as in claim 60, wherein the signaling entity is ferrocene or a ferrocene derivative.

63. A method as in claim 60, comprising exposing the particle to the bead in the presence of the agent and the binding partner further in the presence of an enzyme having the ability to cleave the agent or binding partner.

64. A method as in claim 63, comprising first exposing the agent and the binding partner to the enzyme, then exposing the particle and the bead to the agent and the binding partner.

65. A method as in claim 63, comprising exposing the particle to the bead in the presence of the agent, the binding partner, and the enzyme further in the presence of a candidate drug for moderation of activity of the enzyme.

66. A method as in claim 65, wherein the binding partner comprises a protein or peptide that can be cleaved by the enzyme.

67. A method as in claim 66, wherein the protein is adapted for linkage to the colloid and to the bead.

68. A method as in claim 67, wherein the protein includes a metal binding tag and biotin, one of the colloid or the bead includes a chelate coordinating a metal, and the other of the colloid or bead includes streptavadin.

69. A method as in claim 67, wherein the protein includes a metal binding tag and biotin, the colloid includes a chelate coordinating a metal, and the bead includes streptavadin.

70. A method as in claim 60, wherein the signaling entity is a metallocene and the binding partner comprises a protein that can be cleaved by an enzyme, comprising exposing the particle to the bead in the presence of the agent, the binding partner, and the enzyme further in the presence of a candidate drug for moderation of activity of the enzyme, magnetically drawing the bead into proximity with an electrode, and determining proximity of the metallocene to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in inhibiting cleavage activity of the enzyme.

71. A method as in claim 1, comprising exposing the colloid particle and the non-colloidal structure to an entity adapted for linkage both to the colloid particle and to the non-colloidal structure in the presence both of an enzyme having the ability to cleave the entity and a candidate drug for moderation of activity of the enzyme.

72. A method as in claim 71, wherein the non-colloidal structure is a magnetic bead and the colloid particle carries an immobilized electroactive species, the method comprising magnetically drawing the bead into proximity with an electrode, and determining proximity of the electroactive species to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in inhibiting cleavage activity of the enzyme.

73. A method as in claim 71, wherein the non-colloidal structure is a surface of an electrode and the colloid particle carries an immobilized electroactive species, the method comprising exposing the electrode to the colloid particle, the entity adapted for linkage both to the colloid particle and to the electrode, the enzyme, and the candidate drug and determining proximity of the electroactive species to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in inhibiting cleavage activity of the enzyme.

74. A method as in claim 1, comprising exposing the colloid particle and the non-colloidal structure to a substrate for an enzyme adapted for linkage to the non-colloidal structure, a molecular species linkable to the substrate via enzyme activity adapted for linkage to the particle, and an enzyme for the substrate.

75. A method as in claim 74, further comprising exposing the colloid particle and the non-colloidal structure to a candidate drug for moderation of activity of the enzyme.

76. A method as in claim 74, wherein the non-colloidal structure is a magnetic bead and the colloid particle carries an immobilized electroactive entity, the method comprising magnetically drawing the bead into proximity with an electrode, and determining proximity of the electroactive entity to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in moderating activity of the enzyme.

77. A method as in claim 74, wherein the non-colloidal structure is a surface of an electrode and the colloid particle carries an immobilized electroactive entity, the method comprising exposing the electrode surface to the colloid particle, the substrate, the enzyme, and the candidate drug and determining proximity of the electroactive entity to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in moderating activity of the enzyme.

78. A method as in claim 74, wherein the non-colloidal structure is a magnetic bead.

79. A method as in claim 78, wherein the colloid particle comprises an auxiliary signaling entity.

80. A method as in claim 78, wherein the signaling entity is a metallocene.

81. A method as in claim 80, wherein the signaling entity is ferrocene or a ferrocene derivative.

82. A method as in claim 78, comprising exposing the particle to the bead in the presence of the substrate and the binding partner further in the presence of a candidate drug for moderation of activity of the enzyme.

83. A method as in claim 82, wherein the binding partner is adapted for linkage to the particle via a metal binding tag/metal/chelate linkage and the substrate is adapted for linkage to the bead via biotin/streptavadin linkage.

84. A method as in claim 82, wherein the signaling entity is a metallocene, further comprising magnetically drawing the bead into proximity with an electrode, and determining proximity of the metallocene to the electrode by activating the electrode thereby determining effectiveness of the drug candidate in moderation of activity of the enzyme.

85. A method comprising:

signaling a single binding of a first biological or chemical agent to a second biological or chemical agent with a plurality of signaling entities.

86. A method as in claim 85, comprising signaling the single binding with the plurality of signaling entities simultaneously.

87. A method as in claim 85, comprising providing the first agent carrying the plurality of signaling entities, allowing the first agent to bind to the second agent, and determining the binding via the signaling entities.

88. A method as in claim 87, wherein the first agent is linked to a particle to which the signaling entities are immobilized.

89. A method as in claim 87, wherein the first agent is linked to the signaling entities via a polymer.

90. A method as in claim 87, wherein the first agent is linked to the signaling entities via a dendrimer.

91. A method as in claim 87, wherein the first agent is a biological or chemical ligand, and the second agent is a cell presenting a receptor or protein at a surface thereof the method comprising allowing the ligand to fasten to the receptor or protein.

92. A method as in claim 87, wherein the plurality of signaling entities comprises a plurality of signaling entities linked to a polymer that is linked to the first agent.

93. A method as in claim 87, wherein the plurality of signaling entities comprises a plurality of signaling entities linked to a dendrimer that is linked to the first agent.

94. A method as in claim 87, wherein the first agent is fastened to a colloid particle that includes a plurality of immobilized signaling entities.

95. A method as in claim 85, wherein the plurality of signaling entities comprises a plurality of electroactive molecules.

96. A method as in claim 95, wherein the plurality of electroactive molecules comprises a plurality of metallocenes.

97. A method as in claim 95, wherein the plurality of electroactive molecules comprises a plurality of ferrocene or a ferrocene derivatives.

98. A method as in claim 92, wherein the polymer is linked to the first agent via an affinity tag/binding partner linkage.

99. A method as in claim 92, wherein the polymer is linked to the first agent via a binding tag/metal/chelate linkage.

100. A method as in claim 99, wherein the first agent carries a polyamino acid tag and the polymer carries a chelate coordinating a metal.

101. A method as in claim 93, wherein the dendrimer is linked to the first agent via a binding tag/metal/chelate linkage.

102. A method as in claim 101, wherein the first agent carries a polyamino acid tag and the dendrimer carries a chelate coordinating a metal.

103. A method as in claim 85, wherein at least one of the signaling entities comprises a dye, pigment, electroactive molecule, fluorescent moiety, up-regulating phosphor, or enzyme-linked signaling moiety including horse radish peroxidase and alkaline phosphatase.

104. A method comprising:

determining protein/ligand interaction in the absence of SPR without labeling either the protein or the ligand.

105. A method as in claim 104, comprising exposing a ligand to a protein suspected of interacting with the ligand, the ligand in fixed proximal relationship with an electroactive entity having an electroactive signal dependant upon proximity to the protein.

106. A method as in claim 104, the electroactive entity having an electroactive signal that is alterable dependent upon altered proximity between the electroactive entity and the protein.

107. A method as in claim 104, comprising exposing a protein to a surface at which both the ligand and the electroactive entity are immobilized.

108. A method as in claim 107, wherein the surface is a surface of an electrode.

109. A method as in claim 107, wherein the ligand and electroactive entity each form part of a self-assembled monolayer at the surface.

110. A method as in claim 109, the self-assembled monolayer including a species that enhances permeability of the self-assembled monolayer to electrons.

111. A method as in claim 110, wherein the species that enhances permeability to electrons comprises a conductive self-assembled monolayer-forming species.

112. A method as in claim 110, wherein the species that enhances permeability to electrons comprises a species that causes defect sites in the self-assembled monolayer

113. A method as in claim 104, wherein the electroactive entity comprises a metallocene.

114. A method as in claim 104, wherein the electroactive entity comprises a ferrocene or a ferrocene derivative.

115. A method as in claim 104, wherein the electroactive entity comprises ferrocene dicarboxylic acid.

116. A method as in claim 109, wherein the ligand is linked to a self-assembled monolayer-forming species via an affinity tag/binding partner linkage.

117. A method as in claim 109, wherein the ligand is linked to a self-assembled monolayer-forming species via a metal binding tag/metal/chelate linkage.

118. A method, comprising:

a) providing i) a solution comprising colloids, said colloids comprising a ligand capable of interacting with a cell surface molecule and ii) a composition comprising an electrode comprising growing cells, said cells comprising at least one cell surface molecule capable of interacting with said ligand,

b) adding at least a portion of said colloids to said composition.

119. The method of claim 118, further comprising:

c) detecting the aggregation of said colloids as a measure of the interaction of said ligand with said cell surface molecule.

120. The method of claim 118, wherein said colloid is a gold colloid.

121. The method of claim 120, wherein said gold colloid, prior to step (a), is treated so as to incorporate thiol groups.

122. The method of claim 118, wherein, prior to step (a), said ligand is derivatized with a moiety that has a binding partner.

123. The method of claim 122, wherein, prior to step (a), said ligand is derivatized with a moiety that can bind to a metal chelate.

124. The method of claim 123, wherein said moiety comprises a histidine tag.

125. A method, comprising:

a) providing i) a solution comprising colloids, said colloids comprising a ligand capable of interacting with a cell surface molecule, ii) a candidate drug, and iii) a composition comprising an electrode comprising growing cells, said cells comprising at least one cell surface molecule capable of interacting with said ligand,

b) mixing at least a portion of said colloids with said drug and said composition.

127. A method comprising:

recruiting an electronic signaling entity to an electrode using a magnetic material.

127. A method as in claim 126, comprising recruiting the signaling entity to the electrode in part via protein/protein linkage involved in immobilization between the signaling entity and the magnetic material.

128. A method as claim 127, wherein the protein/protein linkage involves proteins that are not antibodies.

129. An article defining a surface, and a ligand suspected of interacting with a protein and an electroactive entity each immobilized relative to the surface.

130. An article as in claim 129, further comprising a species that enhances permeability of the surface to electrons immobilized relative to the surface.

131. An article comprising:

a first biological or chemical agent, capable of biological or chemical binding to a second agent, immobilized relative to a plurality of signaling entities.

132. An article as in claim 131, wherein the first agent is linked to a particle to which the signaling entities are immobilized.

133. An article as in claim 131, wherein the first agent is immobilized relative to the signaling entities via a polymer.

134. An article as in claim 131, wherein the first agent is immobilized relative to the signaling entities via a dendrimer.

135. An article defining a surface, and a self-assembled monolayer formed on the surface of the article, the monolayer comprising a mixture of a first molecular species having a molecular structure promoting self-assembly at the surface with other first species in a tightly-packed manner preventing fluid to which the surface is exposed from communicating electrically with the surface, and a second molecular species having a molecular structure different from the first species in such a way to cause disruption of the tightly-packed self-assembled structure thereby defining defects in the tightly-packed structure allowing fluid to which the surface is exposed to communicate electrically with the surface.

136. An article as in claim 135, wherein the first species is essentially linear and the second species includes at least one non-linear portion.

137. A composition, comprising a first molecule and one or more signaling entities attached to a solid support, wherein said first molecule is a ligand capable of interacting with a cell-surface receptor or protein.

138. The composition of claim 137, wherein said solid support is a colloid.

139. The composition of claim 138, wherein said colloid is a gold colloid.

140. The composition of claim 138, wherein said ligand is covalently attached directly to said colloid.

141. The composition of claim 138, wherein said signaling entities are electroactive molecules.

142. The composition of claim 141, wherein said electroactive molecules comprise ferrocene or a ferrocene derivative.

143. The composition of claim 137, wherein said ligand is a peptide.

144. The composition of claim 143, wherein said peptide is derivatized with a moiety that can bind to a metal chelate.

145. The composition of claim 144, wherein said moiety comprises a histidine tag.

146. The composition of claim 144, wherein said solid support comprises a metal chelate and said peptide is attached to said solid support via binding of said moiety to said metal chelate.

147. The composition of claim 137, wherein solid support comprises a monolayer of a second molecule.

148. The composition of claim 147, wherein said monolayer is a self-assembling monolayer.

149. The composition of claim 147, wherein said second molecule is a thiol.

150. A composition, comprising a first molecule, a second molecule and a third molecule attached to a solid support, wherein said first molecule comprises a ligand capable of interacting with a cell-surface receptor or protein, wherein said second

molecule forms a monolayer on said solid support, and wherein said third molecule is electroactive.

151. The composition of claim 150, wherein said solid support is a colloid.

152. The composition of claim 151, wherein said colloid is a gold colloid.

153. The composition of claim 151, wherein said ligand is covalently attached directly to said colloid.

154. The composition of claim 153, wherein said electroactive molecule comprises ferrocene or a ferrocene derivative.

155. The composition of claim 153, wherein said ligand is a peptide.

156. The composition of claim 155, wherein said peptide is derivatized with a moiety that can bind to a metal chelate.

157. The composition of claim 156, wherein said moiety comprises a histidine tag.

158. The composition of claim 156, wherein said solid support comprises a metal chelate and said peptide is attached to said solid support via binding of said moiety to said metal chelate.

159. The composition of claim 137, wherein said solid support is a liposome.

160. The composition of claim 147, wherein said liposome comprises at least one lipid containing a reactive group.

161. An article comprising a metal support constructed and arranged to support the growth of cells on a surface thereof, said metal support comprising a monolayer of at

least one type of molecule, said monolayer configured such that metal support can be used as an electrode.

162. An article as in claim 161, further comprising cells growing on the metal support.

163. A composition comprising:
a colloid particle
a signaling entity immobilized relative to the colloid particle; and
a protein immobilized relative to the colloid particle.

164. A species comprising:
a polymer or dendrimer carrying a plurality of signaling entities adapted for linkage to a biological or chemical agent.

165. A species as in claim 164, wherein the polymer or dendrimer is adapted for linkage to the chemical or biological agent via a metal binding tag/metal/chelate linkage.

166. A species as in claim 164, wherein the polymer or dendrimer carries a chelate that can coordinate a metal.

167. A species as in claim 164, wherein the polymer or dendrimer carries a plurality of electroactive species.

168. A species as in claim 164, wherein the polymer or dendrimer carries a plurality of metallocenes.

169. A species as in claim 164, wherein the polymer or dendrimer carries a plurality of ferrocene or a ferrocene derivatives.

170. An article comprising a colloid particle immobilized relative to a glutathione derivative and at least one signaling entity.

171. An article comprising a colloid particle carrying on a surface thereof a self-assembled monolayer comprising a glutathione derivative.

172. A method as in claim 1, wherein the non-colloidal structure is a biological specimen.

173. A method as in claim 172, wherein the biological specimen is taken from a human or animal.

174. A method as in claim 173, wherein the biological specimen comprises cells or a tissue section.

175. A method as in claim 172, comprising providing at least a first and a second biological specimen;

exposing the first and second specimens to colloid particles carrying immobilized species suspected of or having the ability to bind to binding partners presented by the specimens.

176. A method as in claim 175, wherein the first and second biological specimen of are different states of infection or disease.

177. A method as in claim 175, comprising determining a difference in binding of the colloid particles to the first specimen as opposed to the different specimen.

178. A method as in claim 177, wherein the difference comprises a difference in level of binding.

179. A method as in claim 177, wherein the difference is a difference in pattern of colloid immobilization.

180. A method as in claim 175, further comprising:

determining immobilization of the colloid particles to either or both of the specimens

181. A method as in claim 175, wherein the biological specimen or its source has been pre-treated with a candidate drug for modification of a disease state that can be determined by expression level and/or pattern of binding partners expressed by the specimen.

182. A method as in claim 1, wherein the non-colloidal structure comprises an article defining a surface, and a self-assembled monolayer formed on the surface of the article, the monolayer comprising a mixture of a first molecular species having a molecular structure promoting self-assembly at the surface with other first species in a tightly-packed manner preventing fluid to which the surface is exposed from communicating electrically with the surface, and a second molecular species that comprises a molecular wire.

183. A method as in claim 1, wherein the non-colloidal structure is a solid support.

184. A method as in claim 183, wherein the surface is a surface of an electrode.

185. A method as in claim 183, further comprising a ligand and an electroactive entity each forming part of a self-assembled monolayer at a surface of the colloid particle.

186. A method as in claim 185, the self-assembled monolayer including a species that enhances permeability of the self-assembled monolayer to electrons.

187. A method as in claim 186, wherein the species that enhances permeability to electrons comprises a conductive self-assembled monolayer-forming species.

188. A method as in claim 186, wherein the species that enhances permeability to electrons comprises a species that causes defect sites in the self-assembled monolayer

189. A method as in claim 104, wherein the electroactive entity comprises ferrocene dicarboxylic acid.

190. A method as in claim 185, wherein the ligand is linked to a self-assembled monolayer-forming species via a metal binding tag/metal/chelate linkage.

191. A method as in claim 183, wherein the solid support comprises a substantially planar substrate.

192. A method as in claim 183, wherein the surface of the article carries a self-assembled monolayer.

193. A method as in claim 192, wherein the self-assembled monolayer is a conductive self-assembled monolayer.

194. A method as in claim 192, wherein the self-assembled monolayer includes a binding partner for an affinity tag.

195. A method as in claim 194, wherein the binding partner is a chelate able to coordinate a metal.

196. A method as in claim 194, wherein the binding partner for the affinity tag comprises glutathione or biotin.

197. A method as in claim 193, further comprising a chemical or biological agent fastened to the self-assembled monolayer via EDC/NHS coupling chemistry.

198. A method as in claim 193, comprising a plurality of chemical or biological binding partners fastened to the self-assembled monolayer and distributed randomly across the self-assembled monolayer.

199. A method as in claim 193, wherein the self-assembled monolayer includes isolated regions each further comprising a unique chemical or biological binding partner fastened thereto.

200. A method as in claim 182, wherein the colloidal structure includes a chemical or biological agent fastened thereto that is a binding partner or is suspected of being a binding partner of a chemical or biological agent fastened to the surface of the article.

201. A method as in claim 200, wherein the colloidal particle includes and auxiliary signaling entity.

202. A method as in claim 200, further comprising a self-assembled monolayer on the surface of the colloidal particle.

203. A method as in claim 201, wherein the auxiliary signaling entity is an electroactive signaling entity.

204. A method as in claim 201, wherein the auxiliary signaling entity is a visible signaling entity.